

ARTIFICIAL AND NATURAL RADIONUCLIDES IN MARINE ENVIRONMENT OBJECTS OF THE SOUTHERN PART OF THE BARENTS SEA (MAIN RESULTS RECEIVED IN 2006-2010 DURING THE WORKS ON THE JOINT RUSSIAN-NORWEGIAN PROJECT ON MONITORING)

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The works under the Joint Russian-Norwegian Project on monitoring "Investigation of marine environment radioactive contamination of the Barents Sea" were started in 2006. The main goal of joint monitoring is to trace the trends in radiation situation both in the Barents Sea in-shore areas and in the open sea regions. The activities on the project are coordinated by the NRPA from the Norwegian part and by the Roshydromet from the Russian part. In the course of the project works are carried out, in particular: monitoring of the sea water radioactive contamination at three Russian stations located in the open Barents Sea (southern part) and at one Russian coastal station (Teriberka settlement on the Kola Peninsula coast); measuring the present levels of the artificial and natural radionuclides in marine biota (seaweed, marine fish, mollusks) in the vicinity of the Russian coastal station; obtaining the experimental parameters which are necessary for the radioecological modeling. Sampling is performed by the State Institution "Research and Production Association "Typhoon" of the Roshydromet (SI RPA "Typhoon", the leading Russian organization), the Murmansk Territorial Division for Hydrometeorology and Environmental Monitoring and the Knipovich Polar Research Institute of Marine Fisheries and Oceanography (PINRO). Radionuclide analysis of the marine environment samples is performed in the SI "RPA "Typhoon" and the Lomonosov Moscow State University laboratories.

The report presents and discusses the following data received in 2006-2010:

- volumetric activity of some artificial (^{137}Cs , ^{90}Sr , $^{239,240}\text{Pu}$ and tritium) and natural (^{226}Ra , ^{228}Ra and ^{210}Pb) radionuclides in the sea water of the Kola peninsula coast (the Teriberka settlement) and of the open Barents sea stations;
- the content of man-made radionuclides (^{137}Cs , ^{90}Sr , $^{239,240}\text{Pu}$) in marine biological samples taken in the vicinity of the Teriberka settlement: seaweed (*Fucus vesiculosus*, *Laminaria hyperborea*, and others); marine fish - cod (*Gadus morhua*), plaice (*Pleuronectes platessa*), wolf-fish (*Anarhynchus lupus*) and others, mollusks (mussels).

Data of radionuclide analysis shows absence of any influence radiation dangerous objects located in the region on marine environment radioactive contamination in the investigated water areas. The measured levels of long-lived radionuclides ^{137}Cs , ^{90}Sr , $^{239,240}\text{Pu}$ and tritium are in a range typical for the global source of radioactive contamination. Radionuclides were not detected which could arise only from the radiation dangerous objects work and which absent in the global source radionuclide content.

The results received allows also to estimate the parameters necessary for radioecological modeling of the Barents sea ecosystem which characterize the

radionuclide distribution in a system “suspended matter – solution” for the surface sea water and radionuclide accumulation in marine biota.

The report shows the estimates of distribution of ^{137}Cs и $^{239,240}\text{Pu}$ in a system “suspended matter – solution” for the surface sea water, and also accumulation coefficients of artificial radionuclides (in dynamics, starting from 2006) in biological objects of the Barents sea calculated on a basis of data received (accumulation coefficients of ^{137}Cs , ^{90}Sr and $^{239,240}\text{Pu}$ by seaweed *Fucus vesiculosus*, *Laminaria hyperborea*, and others.)